MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2019 / 2020

DCS5268 – COMPUTER PROGRAMMING

(Diploma in Electronic Engineering)

3 MARCH 2020
9.00 A.M. – 11.00 A.M.
(2 Hours)

INSTRUCTION TO STUDENT

1. This Question paper consists of 5 pages including cover page with 4 Questions only.
2. **ANSWER ALL QUESTIONS.** All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the answer Booklet provided.

Question 1

(a) The classical Waterfall model is one of the most popularly used software development life cycle models. Briefly describe the six phases of the waterfall model.

[9 marks]

(b) Figure Q1.1 shows the flowchart for a program that inputs a nonzero positive integer from user, and displays all the positive factors of that integer.

A factor of a given integer is an integer that divides evenly the given integer into another integer. For example, the factors of 15 are 1, 3, 5 and 15.

In the case that the integer entered is negative or zero, an error message should be printed, and the program should be exited immediately.

Based on the flowchart, write a complete C program.

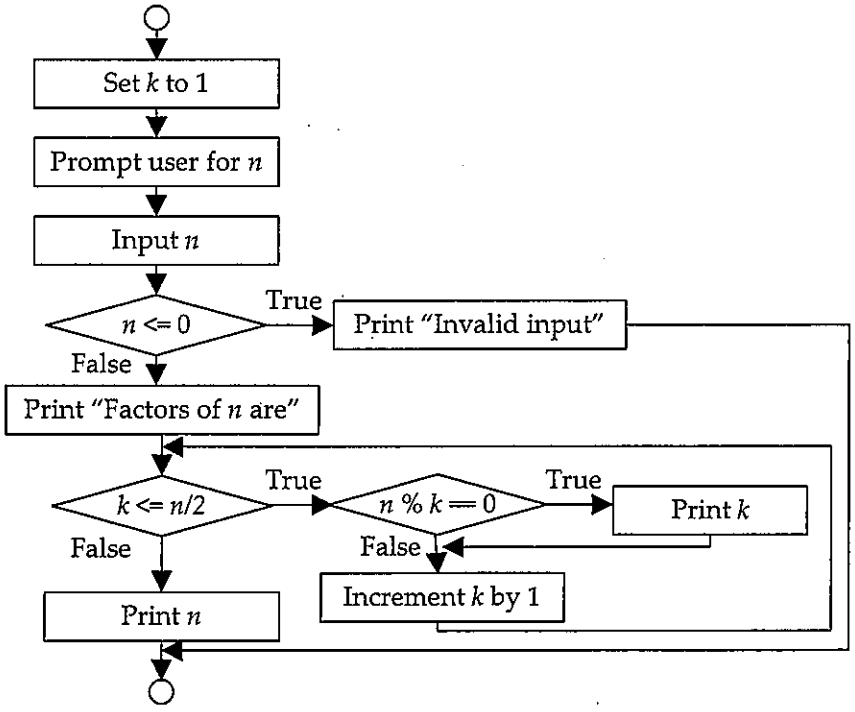

Figure Q1.1

[16 marks]

Continued ...

Question 2

(a) Determine the formatted output of the program segment given in Figure Q2.1.

```
int    a = 15, a2=1;
float  b = 0.0000013579;
char n[] = "Go for it!";

printf("%+d\n%5d\n%.5d\n%#x\n", a, a, a, a);
printf("%10f\n%10g\n", b, b);
printf("%10.6s\n", n);

while(a){
  a/=4;
  printf("%d %d\n", a, a2++);
}
```

Figure Q2.1 [9 marks]

(b) Supermarket A offers instant cash rebate up to RM50, as shown in Table Q2.1.

Table Q2.1

Total purchase (RM)	Cash rebate (RM)
80.0 - <150.0	10
150.0 - <300.0	30
300 or above	50

Write a complete C program that inputs total purchase, and then calculates and displays the payable amount after rebate deduction. The program will be ended when the user enters a negative value.

A sample program output is given in Figure Q2.2 (texts in **bold** are user input).

```
Total purchase (RM, -1 to end)? 200
Payable amount: RM170.00

Total purchase (RM, -1 to end)? 359.90
Payable amount: RM309.90

Total purchase (RM, -1 to end)? -1
Program ended. Thank you.
```

Figure Q2.2 [16 marks]

Continued...

Question 3

(a) Write a complete C program that prompts user for his/her name and 8 body temperature readings he/she has taken on a day. The readings are stored in an array. Then, the program determines and displays the maximum temperature reading of the day. A sample program output is given in Figure Q3.1 (texts in **bold** are user inputs).

```
Enter your name: Alicia Ting
Enter 8 readings: 37.1 36.9 37.4 37.2 37.0 37.5 36.8 37.4
Alicia Ting, your maximum body temperature of the day is 37.50
```

Figure Q3.1 [12 marks]

(b) Students who failed to achieve 80% attendance will be barred from taking final examination.

Table Q3.1 shows a set of student's attendance records enrolled in a class. Write a complete C program that stores all records in Table Q3.1 in an appropriate data structure, and displays the barring list (student ID number along with the attendance percentage).

Table Q3.1

Student ID number	Student name	Attendance percentage (%)
10001	Ali bin Ahmad	59.52
10002	Ben Tai	95.24
10004	Cyndi Lim	61.90
10005	Danesh Kumar	100.00

A sample program output is given in Figure Q3.2.

```
Student ID  Attendance percentage (%)
     10001  59.52
     10004  61.90
```

Figure Q3.2 [13 marks]

Continued...

Question 4

(a) Determine the formatted outputs of the program segment given in Figure Q4.1.

```
int a[]={1,2,4}, b=5;
int *aptr=a, *bptr=&b;

*bptr = (*bptr)*2;
bptr  = aptr;
printf("%d %d %d %d\n", a[1], *a+1, *aptr+1, *(aptr+1));
printf("%d %d\n", (*bptr), b);
```

Figure Q4.1 [6 marks]

(b) Bank C offers Fixed Deposit (FD) interest rate of 3.90% for placement period of 6 months. For simplicity, FD interest is calculated by the formula,

$$FD\ interest = principle \times FD\ rate \times \frac{placement\ period\ in\ month}{12\ months}$$

Write a complete C program consisting of a user-defined function called **calFDInterest** that calculates FD interest for Bank C.

The function **calFDInterest** receives one integer argument for *principle*, and returns the calculated interest.

The function **main** performs each of the following tasks:
- prompts user and inputs for *principle*,
- calls function **calFDInterest** passing *principle* by value, and assigns the return of the function call to *interest*,
- displays the calculated *interest* and payable amount at maturity on the screen.

A sample program output is given in Figure Q4.2 (texts in **bold** are user inputs).

```
Enter principle: 10000
FD interest = RM195.0
Total payable at maturity = RM10195.00
```

Figure Q4.2 [14 marks]

(c) Write additional commands that need to be added into your source code in part (b) so that the principle, FD interest and total payable on the maturity date are printed onto a text file, as shown in Figure Q4.3.

```
Principle  Interest  Total payable at maturity
    10000    195.00                  10195.00
```

Figure Q4.3 [5 marks]

End of paper.